Case Study #3: Pollution Prevention at Medical Facilities in New Mexico, 2001

This case study number three presents general observations and pollution prevention opportunities for hospitals. The purpose of this document is to establish a framework for pollution prevention and waste management at all hospitals. Four different assessments were conducted at hospitals in New Mexico during 2001.

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Step One: Assess Current Situation and Goals

One of the first questions medical facilities must ask is "Who owns the waste system?" A **process owner should be identified** to oversee waste management and source control. Comprehensive waste management involves the oversight and coordination of multiple waste streams from many departments, staff education, collection schedules, vendor relationships, contracts, and regulatory compliance. Indicators or symptoms that ambiguity exists are overfull sharps containers, variation in container types and placement, absence of data, and uncharacterized hazardous wastes.

Most hospital departments generate wastes that are in more than one waste category. A process owner can ensure that wastes in all departments are being managed appropriately and that the myriad of regulatory requirements is met. The goal of a waste management program is to **manage wastes in the most environmentally and economically responsible** fashion, while ensuring regulatory compliance and worker safety are addressed.

Hospitals should accurately determine **waste generator status** by characterizing and counting wastes generated on site. All facilities should address hazardous wastes storage, spill readiness, and furnish materials and training for employees.

Step Two: Identify Pollution Prevention Opportunities

Solid Waste

Organizations should examine solid waste quantities, and opportunities to reduce solid waste through recycling, reuse, and reduction. Set goals, for example, reduce biohazard waste volume by 10%, increase diversion of batteries for recycling, etc. Hospitals should also ask the following questions:

- What is the organization paying for?
- How much waste is really generated?
- Collect solid waste (trash) in clear bags (instead of black bags). This allows for continuous quality improvement by inspection of wastes as they are discarded.
- Workers should wear additional Personal Protective Equipment (PPE) beyond latex gloves when handling bags of trash.
- Request tare slips for every load of solid waste collected to verify waste generation (and full containers).
- Is staff adequately trained on what is solid waste, and what is biomedical waste?

Biohazard Waste

- Review waste acceptance protocols from biomedical collection company.
- Review definition of 'trace' chemo acceptable for disposal in biohazard waste containers. Pharmacy and Oncology departments should ensure only TRACE chemo is being sent off as biomedical waste.
- Chemo spill kits should be available in the biohazard waste storage area. Facilities should have a spill prevention plan and protocol for the biohazard waste storage area.
- NM medical waste regulations require absorbent material (pads preferably) in bottom of each waste container. Provide sorbent pads in packing room or utility areas where waste is aggregated to facilitate compliance with this requirement.
- Medical facilities should control who has access to Biomed Waste Storage Area.

OR Suites: Large red waste container beside anesthesia cart in each OR suite. Consider downsizing or eliminating red bag until end of case. This initiative can reduce red bag waste volume by thousands of bags per year. (4000+ bags = 1 per surgery)

- Employees should have vendor contact information and waste acceptance protocol available.
- Check with vendor to find out if they offer extra services and products such as sorbent pads/material, a staging area for empty containers, etc. Hospitals may want to consider sharing information regarding vendors and compare rates.
- Does your medical facility have a disposal regimen that includes collection at source points for chemo wastes (pharmacy, oncology, and pediatrics) that exceed trace quantities?

OR: contents of anesthesia cart red bag is mostly packaging & clean used items

Hazardous waste

- Inventory and review storage compatibility of materials. Are their unlabeled items on shelves? Define the purpose of the space. Are hazardous materials and hazardous wastes stored seperately? Who has access to hazardous materials and storage facilities?
- Check the EPA RCRA Online module on storage area and compare the requirements against your current storage facility. Very specific requirements exist for fire labeling, fire suppression, secondary containment, signage, training, access, setbacks from property line. See website **http://www.epa.gov/epaoswer/hotline/index.htm** for information on RCRA requirements.
- Reference JCAHO standards that address hazardous materials, hazardous wastes, and list the need for compliance with state, local and federal regulations regarding hazardous waste.

Universal Waste

- Materials such as batteries, thermostats, spent fluorescent lamps, and agricultural pesticides can be collected for disposal under the ***Universal Waste Rule, which*** allows greater flexibility to dispose of some wastes. Recycling carries the least amount of liability and will reduce hazardous waste generation.

- Consider a formalized used battery collection program for all types of batteries. Containers for collection should be labeled **used batteries for recycling**. Identify vendors that will recycle batteries and provide documentation. Disposing of batteries under the ***Universal Waste Rule*** will help reduce hazardous waste volumes.

- Be sure to track how many spent fluorescent lamps are recycled, so that you are sure what is coming in, as new product is also recycled. Also, check to see if U-bulbs from view boxes are being recovered for recycling. Verify with vendor that lamps are recycled as Universal waste and not disposed of as hazardous waste.

- Track how many used batteries are recycled, so that you are sure what is coming in as new product is also going out as Universal Waste. Verify with vendors that batteries are being recycled as Universal Waste and not disposed of hazardous waste.

Recyclable waste

Forty-percent or more of hospital waste is potentially recyclable. There are many options below:

- Consider collecting unused wooden pallets. Some facilities collect and sell them for reuse.
- Recycle cardboard to reduce solid waste pickups. If employees are required to operate a baler. Check to be sure proper *lock out/tag out* program is in place for the baler, and that staff has formal documented training in baler use. Corrugated cardboard can have market value. Explore options with local vendors.
- Medical facilities should make sure collection containers are uniform in appearance, and that they can't be confused with other collection containers, i.e., waste paper collection bins are yellow and hazardous waste containers are yellow.
- Explore diverting other materials for recycling i.e., steel cans in kitchens, scrap metal, construction and demo wastes. Steel cans from kitchen, aerosol cans, etc, may be allowable as part of scrap metal collection. Check with your vendor

Mercury Pollution Prevention

Inventory and phase-out use of mercury containing healthcare products and devices

- Sphygmomanometers
- Thermometers
- Esophageal dilators from endoscopy

Non-mercury esophageal dilator

- Check thermostats and switches to ensure that mercury-containing equipment is retired.
- Check the list of chemicals used by laboratory (outsourced vendor) for mercury containing chemicals and substitute with other chemicals.
- Check cleaning supplies to ensure that they do not contain mercury.
- Mercury collects in drain traps and could lead to a mercury discharge. Implement a

facility-wide drain trap clean out.

Laboratory Pollution Prevention

- Check the City of Albuquerque's **Best Management Code of Practice for Biomedical Laboratori*es*** for best management practices concerning waste formaldehyde solutions. The **Best Management Code of Practice for Biomedical Laboratories** can be downloaded from the p2 Program's web page at http://www.cabq.gov/p2**, or contact the p2 Program at 873-7058/7059 for a free copy!**

"Right sized" formalin containers for tissue samples result in reduced use of formalin, reduced **waste** formalin, improved container storage capacity, & savings

- Minimize use of hazardous chemicals such as Bouins solution. Picric acid is used in fixatives such as Bouin's fixative. Picric acid is explosive when dry, shocked, heated, or comes in contact with metals or metallic salts. It is toxic by skin absorption and its use should be avoided as much as possible. See the **Best Management Code of Practice for Biomedical Laboratories** for more information concerning substitutes, etc.
  - Consider recovering Xylene, please see the **Best Management Code of Practice for Biomedical Laboratories** for information on recycling xylene, and the savings that have resulted at other laboratories.
  - Consider eliminating mercury-containing fixatives.
  - Consider using a non-mercury hematoxlin solution.
  - Right size containers and reduce formalin. See picture to the right.

Hazardous Pharmaceuticals

Many cytotoxic agents fall under the RCRA characteristic wastes (generators are obligated to 'characterize' their waste before disposing of it -- nearly all chemo meds are toxic, some are corrosive/irritant) and should be disposed of accordingly. Review vendor's waste acceptance protocol for chemotherapy wastes.

- Research the potential for using reverse distribution firm to divert expired and unused pharmaceuticals from landfills, wastewater & incinerators. Make sure Reverse Distribution company has the capability to destroy hazardous pharmaceuticals i.e., epinephrine, warfarin, nitroglycerine
- Consider minimizing the number of locations where hazardous pharmaceuticals are prepared and dispensed. Fewer locations can lead to fewer places to have venting hoods, fewer surfaces contaminated, less sites to manage.
- Listed below are three web sites from a cancer center in Texas describing research findings on contamination levels of pharmacies by chemo residuals -- on surfaces, which result in unintentional exposures to pharmacists and pharmacy workers. Another reasons to err on the side of caution when disposing of and managing cytotoxics. http://www.tmc.edu/tmcnews/09_01_99/page_11.html and http://www.uth.tmc.edu/uth_orgs/pub_affairs/mm/september99/cytotoxic.html http://www.uth.tmc.edu/schools/sph/an_agents/guide.htm
- Avoid discharging to the sewer, and red bag disposal of RCRA listed hazardous pharmaceuticals.
- Contaminated Personal Protective Equipment (PPE) can be disposed of as solid waste

Purchasing

Some purchasing agents offer delivery of many healthcare products in reusable totes. Visit **Hospitals for A Healthy Environment - Environmentally Preferable Purchasing Site** at http://geocities.com/EPP_how_to_guide/

Vernacare products i.e., basins, bedpans, & urinals made from recycled newsprint are one alternative to single use plastic patient care products

More Pollution Prevention Opportunities:

Track positive efforts such as toner cartridge recycling, kitchen grease recycling, durable goods reuse and recycling. Develop a training program on waste management for new employees to optimize participation in waste programs.

Warehouse: Resale & redistribution of used, outdated, furniture, supplies, & equipment

Chemo waste container with red bag . Chemo, should have yellow bag, proper labeling & chemo spill kit nearby.

Reusable mops instead of single use disposable

Chemo sharps container with IV bag & tubing inside. Develop a clear policy for acceptable wastes in chemo waste containers.

Dialysis HDPE #2 plastic jugs explore recycling. Could divert more than 100 jugs/week from the landfill

The City's p2 Program can help Albuquerque hospitals conduct waste audits. Contact the p2 Program at 873-7058/7059 for more information.